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ABSTRACT

This report describes and evaluates the TAMARACK integrated curriculum package implemented in a high school classroom in Ontario (Canada). The program integrates environmental science, physical education, and English through experiential instruction. The highlights of the program were producing a magazine of oral history, wilderness trips in challenging and environmentally significant areas, and two experiments in local research laboratories under the direction of working scientists. Parents were actively involved with the class. To evaluate the program, pre-program interviews, mid-point interviews, and post-semester interviews with students and parents were audio-recorded. At the end of the semester, students were beginning to articulate a sense of unity and coherence within TAMARACK. Four transcendent qualities integrating the TAMARACK curriculum were identified: (1) complete process, which refers to students performing complete productive tasks involving a series of steps; (2) authenticity, which refers to the fact that their work was embedded in the real world; (3) community, which refers to relationships developed among classmates; and (4) responsibility, which involved responsibility to the group as well as the individual. Curriculum integration can be viewed as bringing different disciplines together into the same time or place or as transcending disciplines and focusing on a larger social and human perspective. (KS)

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INTEGRATION AND EXPERIENCE

IN THE SECONDARY CURRICULUM

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Now that it's the end of the course, I realize that we've really been through a lot together. We've frozen our butts in cramped little snow shelters and drilled a lake with more holes than in a pound of swiss cheese. We've braved a life-threatening soap explosion and we've walked for days and days with incredibly heavy packs on our backs. And at the same time witnessed Amy swim through every creek on the Western Uplands Trail. We've made laundry hampers out of trees and we've scaled a rock face at Owl's Head Peak. Some of us have experienced the Chrysler Magic Wagon Sound Experience! (laughter) It was really tough going through Green Mud Lake, and just all the portaging and canoeing on the canoe trip.

But the thing that we've really been through together, the thing that we've seen together, is each other. More than anything else. To me TAMARACK has let me get to know other people more than I would in a normal classroom. It's not that TAMARACK has built new character in each one of us, but it's brought out the one that was hidden inside. In times when we were challenged in a situation, in a crisis, or even when we were feeling tired and a little bit silly, we could see what each other was like in a real situation. And it's not something where you can hide behind your other friends or run to your parents for help. "We need you right now, to do your part."

In February we began as just classmates and acquaintances and co-workers, but as the class went on, we've gotten to know each other. And I know that now, even though I've had at some points along the trips, I've had differences of opinion with some of you, and, you know, we've had difficulties, but I feel that in each one of you I see a friend. I think you guys are really a great bunch of people, because not everyone has the guts to take this course, to try something new. We have had to break out of a mold and just do what we want to do. Personally, I think it's really great to discover what I am capable of doing. I know that I can do a 120 km canoe trip and carry my pack and canoe, and I can scale a vertical rock face. And some of us can light a fire in the rain and build a bridge. I can even go into a complete stranger's house and have a conversation with them for over an hour and actually have a good time at it. I'm really proud of myself for doing this. And I'm proud of each one of you as well. (Student's videotaped evaluative statement.)

Mrs. McW. read us some poetry of the season. Some of it was beautiful. Some a little strange, but all good. It makes you think and reflect. We sang a bit and I went out to watch the stars. It's lovely, the starlight reflecting off the snow, the stars twinkling, dancing pinpoints of light against the deep black/blue sky. (Student journal entry.)

In this program you don't learn from one teacher and one text book, you learn from everything. You learn from your experience; you learn from observing and asking questions; you learn from everything you do and people you meet. This is what life's all about: You make friends, you work together, you learn. You go out into the world for half a year and you just live life. (Videotaped evaluative statement.)

The desire to integrate school subjects has been strong and continuous for most of the twentieth century. As Roland Case (1991) puts it, "Who would want learning to be

fragmented?" But desire has not been matched by performance if we are to judge by the persistent survival of isolated instruction based on the disciplines and by the continual stream of reports of short-lived attempts at integration.

In this paper, I will draw on an investigation of students' experiences in an integrated curriculum package in a secondary school to identify four factors which contribute to successful integration. In this case, success is determined by the perceptions of the students and confirmed by parents and teachers. The main thrust of the findings is to show that integration happens, not so much from putting school subjects together into a shared time and place, but from certain types of general experience which transcends disciplines.

TheTAMARACK Program

There is a trend in Ontario secondary schools to offer courses in a package taught by one or two teachers dedicated to a single class (Ontario, 1989). Because the teacher has no other students and the students have no other teacher, the group is free of the usual timetable constraints. Thus it is possible to organize sustained experiences inside and outside school. One major claim of this arrangement is that it promotes integration of the disciplines combined in the package.

Program Description

TAMARACK is one such package. It was offered for the first time in the winter semester of 1991 and was the first integrated package ever offered in the school. The program combined Ontario senior credits in Environmental Science, Physical Education and English. The content highlights of the program were producing a magazine of oral history (Wigginton, 1986; Mackenzie, 1991), wilderness trips in challenging and environmentally significant areas, and two

experiments in local research laboratories under the direction of working scientists. In addition there were numerous related short events such as field trips, guests, and writing (Doubt and Ramsey, 1991).

The mode of instruction was experiential. Students were expected to do everything within reason. For example, the teacher identified local old-timers who would be willing to give the students interviews for the magazine, but the students had to set up the appointments, organize transportation, and master interviewing skills based on interaction with guest journalists and the like.

The instructional pattern was to provide the minimum preliminary instruction required to define the task and ensure safety. It was common for students to talk over the possibilities and their implications before proceeding. Where a new skill was required, there were intervals of practice with coaching and feedback. Students were responsible to perform the work and subsequently to report it in some form. It was common for them to engage in evaluative discussions about progress, success and difficulties. Meaning and learning emerged not only in the thick of the experiences but in the follow-through conversations. This pattern conforms closely to Joplin's (1981) definition of experiential education.

The experiential pattern prevailed in all aspects of class life from planning cooking groups for a trip to making sense of poetry read around a campfire. The centrality, primacy and even urgency of the students' direct experience with every part of the course was a powerful driver in developing the transcendent qualities which lead to integration.

In TAMARACK there was also active involvement of parents. Teacher and parents met several times before and during the program to discuss progress and concerns particularly related to fundraising and parental support with transportation for trips.

The class comprised six females and six males in their third or fourth year of high school. Ability levels were mixed. The program operated within a supportive school context but with some points of friction related to the relative separation of the class from the mainstream

timetable. Two such examples were the difficulty of participating in the school's annual musical theatre production and the maintenance of romantic connections with partners outside the class.

The class had a large classroom of their own and access to a laboratory and darkroom. The bulk of the work in school, such as transcribing interviews, hearing guest presentations, and discussing issues, took place in the classroom. The school's location made it easy to get outside for training day hikes and visits to local establishments like one old-timer's sugar bush to help with the sugar operation. There was also a nearby research facility which made the research experience possible.

The Investigation

A set of pre-program interviews were audio-recorded with 6 students and 6 sets of parents, not necessarily from the same families. The intent of these interviews was to record the expectations and motivations of participants. A set of mid-point interviews was conducted with all the students and with the same parents as before. Finally, some four months after the semester ended, another set of student and parent interviews was conducted. The last two sets of interviews were intended to elicit evaluative opinions about the progress and success of the program primarily from the students' points of view.

Further sources of data were field notes from participant observation episodes, students' journals and videotaped self-evaluations, teacher's day-book and a recorded group interview conducted just as the end of the course by a research assistant who spent 6 weeks participating in the program as a staff member. All information was collected with the informed consent of all those consulted, and only after ethical review.

The interview transcripts and other documents have been analyzed and this analysis is the source from which the following picture emerges. This picture of the program has been validated by the teacher, Mr. W. F. Patterson, for whose willing help and collaboration I am most grateful.

Findings

The preliminary interviews support the belief that students expected, among other more important things, that their work would be unified in some way. During the mid-point interviews, students denied that there were connections among their subjects. The observations at this stage indicated that students were not finding any more integration than they experienced in the regular timetable.

At the end of the semester, in the flush of successfully producing a quality magazine and completing a particularly demanding wilderness canoe trip, students were beginning to articulate a sense of unity and coherence within TAMARACK. The first evidence I had of this was the content of the videotaped statements made by each individual student as a terminal evaluation for the project.

What emerged bore no relationship to discipline-based, integrated curriculum language. Students did not speak about integration happening due to the proximity of discipline segments in time and space. Keeping a journal while working on a forestry field project did nothing, in their minds, to integrate Environmental Science and English. Nor did they say that processes and skills, like problem-solving or writing, bridged the disciplines. Instead, they identified transcendent qualities which were personally and socially significant but otherwise quite irrelevant to the disciplines. It was their personal, direct experience of these qualities in a sustained way that was like a batter to bind disciplinary elements together into an integrated whole.

I have identified four factors in the students' experience which are the transcendent qualities integrating the TAMARACK curriculum: complete process, authenticity, community and responsibility. The first-hand nature of the students' experiences with these qualities is central to their power in effecting integration.

Complete Process

> *We went to see the Canadian Geographic [editor] and we learned that magazine production was going to be pretty darned hard. Well it was. Pretty darned hard! There was a lot of work involved. But I'm glad we did it ... I can't wait to see the first issue. (Videotaped evaluative statement.)*

Complete process refers to productive undertakings in which students performed a complete, or nearly complete, series of steps. For example, a guest taught how to make black ash pack baskets. The process began with students removing the bark from the logs and pounding the wood to peel off long flexible strips of the desired widths. When the logs were reduced to strips, the students began to construct the pack baskets, attending to size and design features. The finished products were eventually put into use. One preliminary step, namely, cutting the logs, was the only one not performed by the students.

Complete process was a hallmark of virtually every element of the program. Students participated in each aspect of magazine production from getting the stories, through editing, layout, cover decisions, financing, printing and sales. Similarly, they participated in the planning decisions and implementation for the trips. Scientific work began with problems and moved through experimental design, experiment, observation, analysis and report writing.

My argument is that complete process is intrinsically integrating. It is impossible to stay within the boundaries of any discipline, but on the contrary it is essential to draw on several disparate disciplines and crafts. This appeal to other disciplines is not driven by teachers' design but by the intrinsic demand of the problem.

Furthermore, students found the complete process very satisfying in that they had an experience of the whole, ending with tangible products almost unimaginable, given the starting point. The experience of complete process in TAMARACK was in striking contrast to the truncated processes experienced more frequently in regular school subjects.

Every program feature revealed complete process, and it seems to me to be the single most important feature underlying the students' perception of integration. The reason is that complete

processes almost always transcend discipline boundaries and provide a more whole view of the world than processes in which large parts are either already done by someone else for the student or are left out.

Authenticity

> *We worked in the Forestry, and that was one of the things I enjoyed most, because we learned an awful lot — — like Tom and I would do genetic engineering related to plant transformations. And we were actually doing an experiment for a paper that's to be published. You had to be extra careful. You got to see how a real lab worked. (Videotaped evaluative statement.)*

Authenticity was the quality most frequently mentioned by students in the final interviews. They valued the fact that their work was embedded in the real world (as they perceived it) outside of school. Even the in-school work existed to serve action in and for the outer community. Experiments done as research assistants under the direction, and in the laboratories, of working scientists were commonly cited as an example. Students appreciated not only the science involved but also the fact that they worked regular laboratory hours with the same privileges and duties as if they had been employed in the facility. Students were sensitive to the isolation of the worlds of school and to the relative inconsequence of school work. For them, work outside school or with school outsiders counted; it made a difference in the world.

Another set of events reinforced the students' experience of authenticity. They made appearances as guest speakers at schools and service clubs. They were interviewed for radio and television programs. They wrote for the local paper. Such public accounts of the program placed it even more firmly in the real world.

Analysis of the teacher's plan book revealed that he sometimes used simulations to focus and develop group interaction, especially cooperation in difficult decision-making situations. Simulations are the counterfeit of authenticity. In a like way, there were frequent training sessions to practice skills such as interviewing, journal writing, navigation, snowshoeing, water

chemistry tests and canoeing. These might have been offered as examples both of incomplete process and lack of authenticity; however, students put such work into the context of being important preparation for the real thing. The contrived problem of getting everyone in the class to stand simultaneously on a suspended, short, plank was valued by the students because it gave critical rehearsal of group process skills required in earnest later. Thus even the simulations were accorded a place in the transcendent category of authenticity.

I think that authenticity works as an integrating factor because students see the outside world as a kind of unity. People in the daily round don't move from discipline to discipline in an ordered, scheduled way as happens in school. The disciplines are present; people do behave in disciplined ways but in a much more free-flowing sequence.

Community

> *... the relationship between students has to be really strong. And at first that builds up slowly because you really don't know the others. That's a key thing because you're with them every day, and the relationship you have with them will help you get things done and have fun. (Interview transcript.)*

> *... it was really neat to see everybody change the way they did. Everybody would help everybody else, and they weren't just being concerned for themselves. (Videotaped evaluative statement.)*

"Community" is my word for a common characteristic which students invariably called "friendship." I have not used their word because observations suggest that in many respects the excellent working relationships which were termed friendships were much more in the way of tolerance, respect and courtesy. The point is that the students put very high value on the interactions among class members and on the communal good. It was singularly important to them to be part of a close-knit and caring group. They accomplished this sense of community by learning to recognize and appreciate each other's qualities.

The teacher's plan book shows that he deliberately and continuously developed community, starting even before the TAMARACK semester began. Pre-semester fund-raising events demanded that every student participate. This preliminary investment in the program set the tone for commitment and for the need to work productively with classmates regardless of personal preferences and idiosyncracies. The first week of class work introduced carefully staged, progressive, adventure elements (Schoel, et al., 1990) which required the class to come to grips with issues of leadership, participation, respect for individual differences and sharing. Perhaps the most important skill the students had to learn was how to express their ideas and feelings to one another. Giving and getting negative feedback in a constructive way was difficult but critical to building community. Ongoing adventure problem elements, like a winter stream crossing, were paralleled by encounters with real life problems – for example, planning a class T-shirt design. Similar discussions attended work on both types of problems.

Community promotes integration because it provides the safe but stimulating climate within which students can begin to push back their unexplored limits and horizons. Each student has a social network for support in the event that a risk does not pay off. The adventure work provides the framework for experiencing and talking about risks and how to deal with them. Detailed talk about group work, when sustained, also promotes honesty which allows disagreement to surface and be dealt with. When the community of risk-takers is known by the students to include the teacher, as it did in this case, the supportive climate is even stronger. Risks inhere in trying to do things that are new or things that have been failed before, or things that one believes are impossible. In every case, boundaries have to be crossed. In such a community, customary disciplinary boundaries do not pose much of a barrier.

Responsibility

> *The stuff we were doing was stuff we wanted to learn and stuff we just learned along the way. We learned a lot by our mistakes. In normal school, you know, we have a test and you lose marks. But in this stuff it wasn't the teacher saying you did this wrong, and this wrong. It was yourself saying I could have done this better if I had done something else. It was us that made the difference. (Videotaped evaluative statement.)*

The fourth transcendent factor contributing to integration is responsibility. The majority of the students were reckoned to be responsible people before they began the course but, as they explained it to me, in regular school they felt responsible only for themselves as individuals. "It's up to me to get my assignments done."

In TAMARACK they felt they had the same responsibility for school work as in other classes, plus additional responsibility related to the developing community and to the outside community where much of their work was done. Doing a good job on organizing trip food was not only a matter of one's own comfort and nutrition but also affected everyone else's welfare. Getting a scientific report right was important for the host scientist as well as for the student author, and also for the reputation of the class for doing good work.

Responsibility was quantitatively greater than in regular school work because students took charge of critical elements of every undertaking. For example, the class held a final banquet at which parents and others close to the program were guests. The teacher provided the locale, the students prepared and cooked an excellent barbeque, including salads and desserts prepared or organized by themselves. Afterwards, there were the usual speeches and presentations but with the difference that students were central in organizing and implementing the event.

Responsibility was also qualitatively different from regular school work because the axis of responsibility shifted beyond the usual responsibility between individual students and teacher. It grew to include responsibilities to classmates for work that had been shared out (like planning evening campfire programs) and responsibilities to members of the outside community (such as interview subjects).

Responsibility works as an integrating factor because it ensures that students are fully committed to the processes. It leads to pride in the entire enterprise and a feeling that they are in charge of what is going on. The students used the word "our" frequently when referring to the magazine. They felt that the curriculum belonged to them and that they had made it what it was. In many respects that feeling was justified, given the number of options they explored and decisions they made. Only fully responsible students can feel that they possess the keys to their education. That feeling is proof against fragmentation regardless of the disciplinary elements that may be introduced from time to time.

Discussion

The commonest view of integration in the literature treats the integrated curriculum in exactly the same way as any other curriculum, namely, from the point of view of the separate disciplines. This view describes attempts in schools to combine disciplines in various ways. It is grounded in the disciplines and treats integrated curriculum as though it were, in itself, a discipline. Because this way of working with integration involves some form of temporal and spatial proximity of distinct disciplines, I have termed it the "fruit cocktail" view of integration.

The fruit cocktail view is exemplified in the literature and in the TAMARACK program. Case (1991) offers a comprehensive account of eight formal components of curriculum integration which provides a useful framework within which any attempt at integration can be fully described in terms of the disciplines involved. Fogarty (1991) describes ten ways of relating disciplines to each other on a kind of continuum from less to more fully integrated. Most descriptions of integrated programs in action (for examples see Palmer, 1991, Jacobs, 1991, and Crane, 1991) show that this view of integration arises within the disciplines and persistently respects disciplinary integrity. It is as though teachers were chefs faced with a variety of fruit

which they wished to cut together into some kind of melange. The issues are which fruits to choose, what relatives proportions to select, and how finely to chop them.

TAMARACK can be described in the same terms. The timetable arrangements permitted the disciplines to brought together into the same time and place. One of the clearest examples is the winter camp work which combined in one day snowshoeing to a distant lake by map and compass (Physical Education), water sample measurements (Environmental Science) and poetry reading (English).

In this account, I do not mean to disparage curriculum integrations based in the disciplines and grounded in teachers' disciplinary expertise. Fruit cocktail is a very fine dish with much capability for variation and high quality nutrition, but it does have the characteristics that the component fruits retain their identity. The degree of integration is limited. This judgement is that of the students in their mid-point interviews: proximity of curriculum elements does not render them integrated.

Another view of integration exists. It is grounded in a broad view of education which assumes that the disciplines are there to be learned and used, but holds a much larger social and human perspective on what education is about. Proponents of this view rarely use the word integration because they begin the process from a different starting place than the disciplines. That starting place is the student and some general theory about the nature of education and human development in personal and social contexts.

James (1968) asserts that "three fundamental human behaviours are enquiry, making and dialogue" (p.76). In oversimplified terms, enquiry is driven by curiosity and means finding out about something or explaining it by any number of means; making is supported by originality and it is the creative and productive aspect of work; dialogue, in her sense of it, means the expression of wonder, even reverence...an essentially non-purposive enjoyment and appreciation of one's world. Dialogue includes a spiritual dimension. For James, unity in curriculum demands that all

three elements be present, quite independently of the way in which the disciplines or their overlapping processes may be arranged.

In a similar way, Waldorf schooling, carefully geared to the readiness of the students and to all of "hand, head and heart," and the transformational aspects of curriculum put forward by Miller (1991) give other examples of transcendent approaches to integration. Gibbons's (1976) vision of the "new" secondary school is perhaps the best well developed view of what integration could be. For Gibbons, students' work would be found in all nine cells of a 3-by-3 matrix made up of experience, study and production activities with personal (individual), interpersonal (social), and impersonal (academic) contexts. Gibbons's vision was strongly grounded within the school's outer community.

These transcendent views of integration are more like a fruit cake than a fruit cocktail. The disciplines persist in recognizable chunks that make sense, but they are imbedded in a pervasive and unifying batter in which raw materials are unrecognizably transformed.

Some current program descriptions show transitions and intermediate stages between the two views, as though someone were pouring a bit of cake batter over fruit cocktail. Beane (1991) describes a middle school integration with both disciplinary and transcendent features such as attention to the emotional life of the students. A thematic curriculum described by Aschbacher (1991) has its origins in the disciplines but moves to include transcendent issues such as the need to challenge students and to create community.

Drake's (1991) vivid description of the struggles of teachers to put integration into practice highlights two critical steps in the transition, namely, the need to let go of established disciplinary values and habits and the need to modify mandated curriculum guidelines.

Conclusion

The TAMARACK students gave accounts of their experiences which strongly support the belief that integration happens through the action of transcendent factors. In their particular case, the factors were complete process, authenticity, community and responsibility. These factors were present as a direct result of the teacher's intention to maximize the students' experiences with them. I suspect that the experience of challenge may be another factor in TAMARACK which further study will reveal. These four factors have strong relationships to the transcendent characteristics given in the literature.

There is no reason to think that the TAMARACK case contains all of the possible transcendent components which could enhance integration. Other curriculum packages could well reveal that qualities such as craftsmanship, esthetics, service or ceremony would provide the necessary transcendent value. Whether or not such speculation is justified must await further investigation.

Finally, it is important to recognize that, in TAMARACK, it took several months for the students to begin to recognize that the curriculum was coming together for them. I draw the moral that it takes time and sustained intensity for the transcendent factors to have their effect. Fruit cocktail can be assembled relatively quickly, but a fruit cake takes longer to bake and season.

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